

TABLE OF CONTENTS

Executive Summary

1.0	INTRODUCTION	1
1.1	Background	1
1.2	Scope of Work	1
1.3	Additional Services	2
1.4	Plan Goals	3
1.5	Water Quality Goals	4
1.6	EPA Water Quality Permits	7
1.7	Education and Community Outreach	8
2.0	BERRY BROOK WATERSHED DESCRIPTION	14
2.1	Physical Description	14
2.2	Land Uses and Demographics	20
2.3	Precipitation and Hydrology	21
2.4	Topography and Soils	22
2.5	Climate	23
2.6	Undeveloped Areas and Riparian Corridors	23
2.7	Floodplains	24
2.8	Wetlands and Aquatic Habitat	25
2.9	Threatened and Endangered Species	27
2.10	Wildlife	27
3.0	WATER QUALITY DATA	29
3.1	Water Quality Standards	29
3.2	Existing Conditions	30
3.3	Potential Contaminant Sources	33
3.4	Overview of Water Quality Impairment	36
4.0	RECOMMENDED STORM AND PROCESS WATER BEST MANAGEMENT PRACTICES (BMPS)	38
4.1	Stormwater Inflows	38
4.2	Stormwater BMPs	39
4.3	Proposed WTP Filter Backwash (BMP#15)	44
4.4	Recommended City Regulations Revisions	46
5.0	NATURAL RESOURCES BEST MANAGEMENT PRACTICES	47
5.1	Berry Brook Headwaters (BMP#16)	47
5.2	Conservation Easement (BMP#17)	48
5.3	Corner of Ash and Horne Streets (BMP#18)	48
5.4	#48 Horne Street (BMP#18A)	49
5.5	Ash Street Crossing (BMP#19)	50
5.6	Hough Street Crossing (BMP#20)	50
5.7	Sixth Street and Confluence with Cocheco River (BMPs 21 & #23)	51
5.8	Streambank Restoration	52
5.9	Bacteria Reduction	53
5.10	Private Property Owner Recommendations	53
5.11	Drainage/Maintenance Easements	54



6.0	REQUIRED LOAD REDUCTIONS.....	55
6.1	Methodology.....	55
6.2	Application of Methodology	57
6.3	Results of Pollutant Loading Analysis	59
6.4	Low Impact BMP Analysis	64
7.0	PRIORITIZATION OF PROJECTS	69
8.0	BMP COST ESTIMATES	71
9.0	WATER QUALITY MONITORING AND EVALUATION	73
10.0	FUNDING SOURCES	74
10.1	General Appropriations	74
10.2	Fees	74
10.3	Dedicated Revenues	74
10.4	Federal and State Loans or Grants	75
11.0	CONCLUSIONS AND RECOMMENDATIONS.....	78
11.1	Conclusions.....	78
11.2	Recommendations	79
12.0	REFERENCES.....	82

FIGURES

- 1 – Locus Map
- 2 – Watershed Overview
- 3 – Natural Resources
- 4 – Potential Pollutant Sources and BMPs
- 5 – Infiltration Basin – Typical Detail
- 6 – Bio-Filtration Swale – Typical Detail
- 7 – Ditch Restoration – Typical Detail
- 8 – Water Treatment Plant Site BMPs
- 9 – Layout at River Confluence
- 10 - Streambank Restoration – Typical Detail
- 11 – Drainage Areas for Pollutant Loading

TABLES

- 1 – NHDES Designated Uses in Berry Brook (NHDES, 2005)
- 2 – NHDES Categories for Uses and Parameters (Pertaining to Berry Brook).....
- 3 – Discharge Limits for Water Treatment Plant
- 4 – Water Quality Data of the USGS Surveys, 2001-2003 (USGS, 2005).....



5 – Summary of Recommended BMPs.....	(Attached)
6 – WTP filter Backwash Data	(Attached)
7 – Annual Pollutant Concentrations from Source Areas, C	56
8 – BMP Pollutant Removal Efficiencies	57
9 – Study Points/Points of Interest Description.....	58
10 – Base Model	(Attached)
10A – 10D – Results of Loading Analysis - Existing with BMPs and Target %Ia	60 – 63
11 – Supplemental Analysis #1 – Engineered BMPs Combined with Low Impact BMPs	
.....	(Attached)
12 – Supplemental Analysis #2 - Engineered BMPs Combined with Low Impact BMPs.....	
.....	(Attached)
13 – Supplemental Analysis #3 - Engineered BMPs Combined with Low Impact BMPs..... (Residential & Horne Street School)	(Attached)
14 A – 14D - Supplemental Analysis #3 - Engineered BMPs Combined with Low Impact BMPs (2/3 Residential & Horne Street School)	65 - 68
15 – Prioritization of Projects	69
16 – Recommended BMPs – Conceptual Construction Cost Estimates.....	71
15A – 15G – Conceptual Construction Cost Estimates	(Attached)
16 – Conceptual Construction Cost Estimate – BMP#15 – WTP Backwash Treatment.....	
17A – 17L – Conceptual Construction Cost Estimates	(Attached)
18 – Conceptual Construction Cost Estimate – BMP#15 – WTP Backwash Treatment.....	(Attached)
19A - Federal Grants and Loans.....	75
19B - State of NH Grants and Loans	76

APPENDICES

- 1 – Correspondence
- 2 – Historic Water Treatment Plant Site Plan
- 3 – Recommended BMP Equipment Information
- 4 – Private Property Owner BMPs
- 5 – Potential Funding Source Information

